Patent Application of

Stephen G. Brown

for

AIR SUPPORTED BOOK STAND

Background—Field of Invention

This invention relates to bookstands, specifically to an improved product to hold and support books and other media for reading, writing and viewing.

Background—Discussion of Prior Art

For many years, bookstands have been created to support the weight of books and hold them at an incline to reduce eyestrain, neck pain and muscular fatigue for the reader. Nearly all of these bookstands are made of wood, sheet metal or hard plastic and are intended for use on a tabletop. Hard materials cause them to be heavy, bulky, and expensive. They are uncomfortable and unstable in the viewer's lap, or on their stomach when lying down. Many of these bookstands are not portable.

The book support in patent 3937435 to Roberts, 1976 February 10, has sharp edges and corners that could mar the book or a table finish, and would be unstable and uncomfortable when used in the viewer's lap. The book holder in patent 5377946 to Pannu, 1995 January 3, may be used by the reader in bed, but it is large, and difficult to move. The reading stand in patent 5720465 to Peltzer, 1998 February 24, is complex, difficult to use and expensive to produce.

The collapsible book stands in patents 4116413 to Andersen, 1978 September 26, and 5829729 to Welch, 1998 November 3, are hard edged and sharp. They are metal and are too heavy to be considered portable. The collapsible book stand in patent 5413305 to Leeb, 1995 May 9, is softer and may become compact and portable, but it only tilts the top up. It does not raise the entire book to more fully ease neck strain.

Objects and Advantages

Accordingly, several objects and advantages of my air-supported book stand are:

(a) to provide a book stand that supports a range of book sizes, from paperbacks to large heavy books to be viewed comfortably in the readers lap or on a table for prolonged periods;

(b) to provide a book stand that need only be inflated to use, and is extremely light and compact when deflated for portability or storage;

(c) to provide a book stand that not only supports the book's weight and tilts the page toward the reader's view, but also raises the bottom of the book up off the lap or table to bring the content closer to the reader's eyes;

(d) to provide a holder that will also accept other media for reading, viewing or manipulating such as magazines, electronic book readers, tablet PCs, notebook computers, portable DVD players and some electronic games;

(e) to provide a book stand that is so inexpensive to produce that anyone who could afford a book could likely purchase it;

(f) to provide a book stand that is so lightweight that when reading is interrupted, it is easy to hold and carry the stand with the book;

(g) to provide a book stand that won't mar the book or the tabletop; and

Further objects and advantages are to hold large books open without obstruction of page turning. Because the surfaces upon which the book rests are able to conform to the shape of the book, larger books do not spring closed and do not flop open to other sections as they would if the resting surface were completely flat. In addition, the bottom edge of small paperbacks can be tucked into the shelf pocket enabling the book holder to keep a small book open to a page without hands even outdoors in a breeze. Still further objects and advantages will become apparent from a consideration of the ensuing description and drawings.

Brief Description of Drawing Figures

FIG. 1 is a perspective view of the front right corner of the stand when inflated.

FIG. 2 is a perspective view of the left rear corner.

FIG. 3A is a top view of the main embodiment with flattening spans, deflated and before secondary welds AB and CD.

FIG. 3B is a sectional view taken along the line 3B—3B of FIG. 3A.

FIG. 4A is a top view of the stand without flattening spans, and before secondary welds AB and CD.

FIG. 4B is a sectional view taken along the line 4B—4B of FIG. 4A.

FIG. 5A is exploded view of the main embodiment with flattening spans.

FIG. 5B is an exploded view of the stand without flattening spans.

FIG. 6 is the stand with a large hardbound book.

FIG. 7 is the stand with a paperback book.

FIG. 8 is the stand with an open notebook computer.

FIG. 9 is the stand with a Tablet PC, or an electronic book (ebook) reader.

FIG. 10A is a front corner perspective view of another embodiment.

FIG. 10B is a right rear corner view of article in FIG. 10A.

FIG. 11A is FIG. 10A with internal flattening feature.

FIG. 11B is FIG. 10B with internal flattening feature.

FIG. 12 is an alternative embodiment of an air-supported book stand with a firm material on inclined surface.

FIG. 13 is another alternative embodiment with a firm material on both the inclined surface and the base, and with an open hardbound book oriented above for reference.

FIG. 14 is yet another embodiment combining firm and flexible materials.

FIG. 15 shows how the device in FIG. 14 can be self-inflating through the air inlet when the loose ends of the firm surfaces are urged apart.

FIG. 16 is a collapsed view of the device in FIG. 15 after the air is squeezed out.

Reference Numerals In Drawings

20	air-permeable front fold	22	air-permeable back fold
24	air-permeable upper fold	26	back outer surface
28	front outer surface	30	shelf outer surface
32	base outer surface	34	shelf inner surface
36	front inner surface	38	base inner surface
40	back inner surface	42	left vertical side seam
44	left inclined side seam	46	left base side seam
48	left shelf side seam CD	50	right vertical side seam
52	right inclined side seam	54	right base side seam
56	right shelf side seam AB	58	shelf end seam
60	inclined member end seam	62 – 76	circle welds
78 – 82	flattening welds	84	air inlet and plug
86 – 90	flattening spans	92	inclined member
94	vertical member	96	base
98	shelf		

Summary

In accordance with the present invention an air-supported book stand in the preferred mode comprises an inclined member, attached to a vertical member, attached to a base, attached to a shelf against the lower front of said inclined member, each composed of walls of airtight sheet material, and containing air by way of a plugged air inlet.

Description of Preferred Embodiments

A typical embodiment of my air-supported book stand is illustrated in FIGS. 1 & 2, showing that support strength and flatness may be achieved through contiguous surfaces and the air pressure contained therein. The circular welds reduce air volume in base 96, leaving the remaining members of the stand to bear the weight with stability. FIG. 4A shows that all welds are in the same 2-dimensional plane, allowing all welds but left shelf side seam 48 and right shelf side seam 56 to be accomplished automatically through the weld tooling. FIG. 3A has still more welds because of the inclusion of flattening spans 86 – 90. These spans are also shown in the section in FIG. 3B and in the exploded view in FIG. 5A.

FIG. 6 shows how larger books may extend beyond the sides and top of the stand. Shelf 98 and inclined member 92 are not joined, except at right shelf side seam 56 and left shelf side seam 48, to allow the bottom edge of reading material and electronic devices to be wedged therein as in FIGS. 7 – 9.

FIGS. 10A & 10B show an alternative embodiment that may balloon toward a spherical shape. FIGS. 11A & 11B, and the descriptions of other alternative embodiments, employ welded-in internal flattening features. Firm material shown in FIGS.12 –16 on the inclined and base surfaces reduce this ballooning tendency of inflatable products. These firm surfaces with the flexible surfaces, if used together like a bellows, provide means for self-inflation of the book stand, as shown in FIGS. 14 –16.

Conclusions, Ramifications, and Scope

Accordingly, the air-supported book stand alleviates fatigue from the weight of the book, and also the weight of the reader's own hands and arms, which hold up the book. Unlike other products, my invention is soft and comfortable for lap use. Arms may rest in the lap, on the open pages of the book, or in the open void in the middle of the book stand, and if needed, thumbs may be used to hold the pages open. Furthermore, the air pillow aspect of my invention has the additional advantages that

- It is space saving when deflated, and therefore easy to store and portable.
- It is simple to assemble, lightweight and inexpensive to manufacture and purchase.
- The air cushion broadly distributes the weight of the book and the weight of the reader's hands and arms rather than concentrating this weight down to three or four pressure points that might mar a table finish or create discomfort in the viewer's lap.

- Front (28) and shelf (30 & 34) conform to the page bottoms and open book cover thus alleviating some of the springiness that might cause the book to close or flop open to another place.

- All seams except left shelf side seam 48 and right shelf side seam 56 are accomplished automatically through the weld tooling because they are in the same 2-Dimensional plane.

An alternative embodiment is shown in FIGS. 10A & 10B. The quantity of sheet material required for this version is diminished by almost half. Seam lengths are also decreased.

Another alternative embodiment, shown in FIGS. 11A & 11B, improves the flatness of the base and inclined surfaces of the previous embodiment through internally welded expansion restrictors.

Another alternative embodiment flattens the inclined and base surfaces through the use of harder material on these surfaces as in FIGS.12 –16. The manual separation of the free ends of these surfaces enables a self-inflating feature. Air is drawn in through a closeable air-inlet. Constraining these loose ends together deflates the product for compact storage as in FIG 16.

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently referred embodiments of this invention. For example, the air-supported book stand may be of different angles, shapes or dimensions, or may enclose different volumes of air or a number of separate volumes; use other shapes instead of circles in the base, use firm materials in combination with flexible materials; and use simple welds instead of internal spans (known as "I – beams" in the inflatables industry) and spans instead of simple welds.

Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

Operation of Invention

Vertical member 94 supports inclined member 92. Inclined member 92 and shelf 98 together support the book. Base 96 keeps the lower portions of shelf 98 and inclined member 92 at a fixed distance from the lower portion of vertical member 94 so that the stand remains erect at a predetermined angle. Circle welds 62 – 76 are to restrict the air contained in base 96 that would otherwise produce tabletop instability. Air inlet and plug 84, and airtight seams 42 – 60, serve to contain the air volume. The interruptions in the welds on folds 20 – 24 allow the stand to be filled from a single

air inlet. Shelf 98 lifts larger hardbound books (FIG. 6), or in the case of smaller paperback books, may trap the bottom edge if readers wish to do hands-free reading (FIG. 7).

When deflated, my book stand is in very thin and will fold for compact storage or portability in a book bag. When deflation is not possible or desirable, a user may simply put an arm through the middle of the stand and keep both hands free for carrying other items.

Portable electronic devices can be held between shelf 98 and inclined member 92 thus lifting the display to a comfortable viewing height (FIGS. 8 & 9). While my stand does not offer a comfortable keyboard angle for notebook computers, some applications, games, and DVD viewing will not be significantly hindered.

When seated without a table, tablet computer users are greatly aided in reading, writing and stylus control of applications when my air-supported stand is used in lap. The user is more upright, reducing parallax, eyestrain, neck, back, and arm fatigue, and the user can be more engaged in the meeting.

Electronic book readers will use my stand much the same as do printed book readers since they both involve mostly static viewing with the occasional page advance or page turn.